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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant:	**Kent D. VINCENT, et al.**	Examiner:	Sheeba AHMED
Serial No.:	**09/981,166**	Art Unit:	1773
Filed:	October 16, 2001	Our Ref:	B-5692 952733-4 10005747-1 US
For:	"HIGH RESOLUTION DISPLAY"	Date:	September 26, 2006
		Re:	***Appeal to the Board of Appeals***

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the rejection dated April 26, 2006, for the above identified patent application. Appellants submit that this Appeal Brief is being timely filed because the Notice of Appeal was filed on July 26, 2006. Please deduct the amount of $500.00 for the fee set forth in 37 C.F.R. 1.17(c) for submitting this Brief from deposit account no. 08-2025.

REAL PARTY IN INTEREST

The real party in interest to the present application is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences related to the present application.

STATUS OF CLAIMS

Claims 1-55, 57-62 and 64-67 are the subject of this Appeal and are reproduced in the accompanying appendix.

STATUS OF AMENDMENTS

No Amendment After Final Rejection has been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention claimed in claim 1 is directed to an electronically addressable display (400, 500) comprising a substrate (403); associated with the substrate, an addressable display bi-modal molecular colorant stratum (401, 505, 507, 509); and associated with the molecular colorant stratum, an addressing device (407 & 409, 501 & 502, 503 & 504, 604) mounted for selectively switching colorant molecules of the stratum between at least two visually distinguishable states (paragraphs 58-93, Figs. 2AA-6AA).

The invention claimed in claim 26 is directed to an electronic appliance (711, 800, 900, 1000, 1100) comprising an appliance housing; and incorporated with the housing, a display device (700, 801, 901, 1001, 1101), the display device including at least one writeable imaging stratum (401, 505, 507, 509) forming a pixel array of a bi-modal molecular colorant, and an addressing device (407 & 409, 501 & 502, 503 & 504, 604) mounted for selectively switching colorant molecules of the imaging stratum (paragraphs 58-102, Figs. 2AA-11AA).

The invention claimed in claim 36 is directed to a visual display (400, 500) comprising at least one writeable imaging stratum (401, 505, 507, 509) forming a pixel array of a bi-modal molecular colorant; and at least one addressing device (407 & 409, 501 & 502, 503 & 504, 604) mounted for selectively switching colorant molecules of the imaging stratum (paragraphs 58-93, Figs. 2AA-6AA).

The invention claimed in claim 48 is directed to a method for displaying digital data, comprising selectively producing localized electric fields at picture elements of a viewing screen

(400, 500 ; and using said fields to induce band gap changes in molecules forming said picture elements thereby changing an optical property thereof (paragraphs 62-76, Figs. 2AA-6AA).

The invention claimed in claim 50 is directed to a method of fabricating a rewritable display screen, comprising depositing a substantially homogeneous layer of bi-modal molecular colorant (401, 505, 507, 509) on a surface (403); and providing addressable elements (407 & 409, 501 & 502, 503 & 504, 604) adjacent said surface for matrix addressing said surface as addressable picture elements (paragraphs 58-93, Figs. 2AA-6AA).

The invention claimed in claim 58 is directed to a wireless communications appliance (711, 800, 1100), comprising a wireless interface (717); a display screen (800, 801, 1101) having at least one writeable imaging stratum (401, 505, 507, 509) forming a pixel array of a bi-modal molecular colorant; and at least one addressing device (407 & 409, 501 & 502, 503 & 504, 604) mounted for selectively switching colorant molecules of the imaging stratum (paragraphs 58-93, Figs. 2AA-6AA).

The invention claimed in claim 62 is directed to a projection apparatus comprising display means for projecting an image, said display means having a transparent substrate (403) and, associated with said substrate, at least one writeable imaging stratum (401, 505, 507, 509) forming a pixel array of a bi-modal molecular system; and associated with said imaging stratum, at least one addressing means (407 & 409, 501 & 502, 503 & 504, 604) for selectively switching colorant molecules of the imaging stratum forming an image for projection (paragraphs 58-93, Figs. 2AA-6AA).

The invention claimed in claim 64 is directed to an electric field addressable viewing screen (400, 500) comprising a substrate (403); and at least one layer of a bi-modal molecular colorant (401, 505, 507, 509) associated with said substrate such that colorant molecules are addressable as picture elements of the viewing screen, electrically switching the colorant molecules between at least two visually distinct states selectively (paragraphs 58-93, Figs. 2AA-6AA).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Issue 1: Whether claims 1, 17-19, 20, 21, 23-25, 34, 36-43, 45, 49-52, 62 and 64 are patentable under 35 USC 102(b) in view of EP 0427507 A2 to Sheridan (hereinafter "Sheridan").

Issue 2: Whether claims 1-4, 17-19, 20, 21, 23-25, 34, 36-43, 45, 49-52, 62 and 64 are patentable under 35 USC 102(b) in view of U.S. Patent No. 5,389,945 to Sheridon (hereinafter "Sheridon").

Issue 3: Whether claims 1-22 and 36-46 are patentable under the judicially created doctrine of obviousness-type double patenting in view of claims 1, 5, and 8-12 of U.S. Patent 6,947,205 B2 (hereinafter "the '205 patent"), claims 1-22 and 36-46 are patentable under the judicially created doctrine of obviousness-type double patenting in view of claims 1-16 of U.S. Patent 6,876,570 B2 (hereinafter "the '570 patent"), and claims 1-55, 57-62 and 64-67 are patentable under the judicially created doctrine of obviousness-type double patenting in view of claims 1-19 of U.S. Patent 6,853,577 B2 (hereinafter "the '577 patent").

GROUPING OF CLAIMS

For each ground of rejection which Appellants contest herein and which applies to more than one claim, such additional claims, to the extent separately identified and argued below, do not stand or fall together.

ARGUMENT

Issue 1: Whether claims 1, 17-19, 20, 21, 23-25, 34, 36-43, 45, 49-52, 62 and 64 are patentable under 35 USC 102(b) in view of EP 0427507 A2 to Sheridan (hereinafter "Sheridan").

In section 3 of the final Action of April 26, 2006, the Examiner maintains his rejection of claims 1, 17-19, 20, 21, 23-25, 34, 36-43, 45, 49-52, 62 and 64 as being anticipated by Sheridan. In their previous submission, Appellants endeavored to explain to the Examiner that the "spherical balls" of Sheridan are not at all anticipatory of the bi-modal molecular colorant stratum, which as clearly set forth in the specification is composed of individually rotatable molecules that can be gyrated about their axis through the application of an electric field. Sheridan, on the other hand, discloses microspheres (also referred to in the art as a "microcapsules") that are many orders of magnitude larger and that operate through a completely different mechanism – differences that were painstakingly set forth for the Examiner's convenience in a table that is also attached hereto as Exhibit 1 of Appendix B. In summary, each

described microcapsule is a hollow spherical shell known in the art as a "gyricon" having black and white hemispheres that have their position affected by an electrical field. This is a type of electrophoretic movement of a fixed colorant toward and away from the viewer. The present invention's molecular colorant has individual molecules that are each a true optical switch wherein each molecular switch is "flipped" by electricity, involving molecular band gap color changes within each molecule.

In the present Action, the Examiner conveniently decides to ignore the highly-detailed definition of bi-modal molecular colorant stratum in the specification, justifying his election to "broadly interpret" this limitation well beyond its clearly defined bounds by noting that the claims are not limited to a single molecule switching between two visually distinguishable states. The Examiner further dismisses the detailed, in-depth discussion of the make-up and mode of operation of the molecules making up the presently claimed bi-modal molecular colorant stratum by offering that he "would like to point out that at Page 33, lines 7-10 state that 'the present invention, being a colorant stratum 401 at the surface of the display screen 400 (or behind the: protective coating 405) has no such limitation, making it more CRT or HDW like in appearance' and does not provide a definition or detailed description." These two "answers" simply make no sense.

Erstwhile, claiming a single molecule would not claim a workable apparatus – and thus afford absolutely no protection to Appellants against infringers. Furthermore, the Examiner's insistence on equating the microspheres of Sheridan with Appellants' bi-modal molecular colorant stratum because "the claimed invention as recited is not limited to a single molecule designed to change in structural conformation when an electric field is applied" is (1) unfounded in light of the pertinent Laws and Rules, and (2) WRONG. There is absolutely no reason under the law, and none is offered by the Examiner, as to why the claimed invention should be limited to a single molecule. There is nothing more Appellants need to note about this.

As for the Examiner's allegation that the claimed invention is not limited to *molecules* designed to change in structural conformation when an electric field is applied, Appellants respectfully direct the reader's attention to the specification - and especially the fifteen paragraphs under the heading "Molecular Colorant/Colorant Molecules" - which clearly and in great detail explain exactly what a bi-modal molecular colorant stratum is and how it works at

the molecular level. Appellants further note that "bi-modal molecular colorant stratum" does not have a generally accepted meaning within the art - and once again, the Examiner has certainly not offered one iota of evidence to contradict this – and therefore Appellants are entitled to the full benefit of the well established doctrine that applicants are their own lexicographers. There is simply no valid reason for the Examiner's continued insistence on completely and thoroughly ignoring the specification and assigning *ad hoc* meanings to the claim elements as best suit the Examiner's apparent desire to find the claims anticipated by the art, in clear contradiction of the plain language of the specification.

As for the Examiner's proffered reasoning as to why the specification does not allegedly provide a definition or detailed description of a bi-modal molecular colorant stratum, it is so devoid of merit as to be misleading. The quote that the Examiner relies on (for no reason that is apparent to Appellants) actually comes from paragraph 93, and has absolutely no connection with the discussion (noted in the preceding paragraph) of the claimed bi-modal molecular colorant stratum. The majority of the paragraph in fact reads:

> It can now be recognized that a display in accordance with the present invention requires no backlighting as required in conventional LCD displays, providing a device requiring a low supply power requirement. Lighting or backlighting becomes completely optional, depending on the specific implementation. Moreover, the power savings is greatly improved by the preferred embodiment wherein the molecules are structured to be substantially permanently bistable in the color or transparent mode once set. In essence, this is a power-free standby mode. *Further, it is well-known that LCD-type displays have a limited viewing angle* wherein moving off the axis diminishes viewability. *The present invention,* being a colorant stratum 401 at the surface of the display screen 400 (or behind the protective coating

405) *has no such limitation*, making it more CRT or HDTV like in appearance. [emphasis added]

What does anything in this paragraph have to do with the molecular make-up of a bi-modal molecular colorant stratum? Appellants are at a complete loss as to the logic employed by the Examiner in convincing himself that this paragraph negates the discussion found elsewhere in the specification detailing the make-up and operation of the claimed bi-modal molecular colorant stratum, and respectfully request the Board to not allow this diversion to distract them from the issue at hand.

In view of all of the above, Appellants respectfully submit that the Examiner's rejection in view of Sheridan is completely baseless as it is founded upon an unsupported and unsupportable reading of the claim limitations that completely mischaracterizes the invention, and request the Board to kindly overturn the Examiner on appeal and pass all claims to issue.

Issue 2: Whether claims 1-4, 17-19, 20, 21, 23-25, 34, 36-43, 45, 49-52, 62 and 64 are patentable under 35 USC 102(b) in view of U.S. Patent No. 5,389,945 to Sheridon (hereinafter "Sheridon").

In section 4 the Examiner further maintains his rejection of claims 1-4, 17-19, 20, 21, 23-25, 34, 36-43, 45, 49-52, 62 and 64 as being anticipated by Sheridon. As explained in their previous reply, Appellants noted that "Sheridon" is actually the same Sheridan who authored EP 0427507 A2 discussed above, and this document described the same exact technology as EP 0427507 A2. Thus, for the sake of brevity, Appellants submit that the above discussion of Sheridan *vis a vis* the claims is equally probative of the patentability of the claims over "Sheridon" and, for the same reasons advance above, respectfully request the Board to also overturn this rejection on appeal.

Issue 3: Whether claims 1-22 and 36-46 are patentable under the judicially created doctrine of obviousness-type double patenting in view of claims 1, 5, and 8-12 of U.S. Patent 6,947,205 B2 (hereinafter "the '205 patent"), claims 1-22 and 36-46 are patentable under the judicially created doctrine of obviousness-type double patenting in view of claims 1-16 of U.S. Patent 6,876,570 B2 (hereinafter "the '570 patent"), and claims 1-55, 57-62 and 64-

67 are patentable under the judicially created doctrine of obviousness-type double patenting in view of claims 1-19 of U.S. Patent 6,853,577 B2 (hereinafter "the '577 patent").

In sections 5-7 the Examiner maintains double-patenting rejections in view of the commonly-owned patents noted immediately above. Appellants have previously objected that this amounts to inconsistent prosecution by the Patent Office in view of the fact that these very same patents were found not to be anticipated by the Sheridan and "Sheridon" references discussed above. Presently the Examiner offers what can only be understood as a complete endorsement of Appellants' position: "the Examiner maintains that consistent prosecution has been afforded to the Applicants in the instant case and that the assignee's U.S. Pat. Nos. ... do not contains (ibid) claims identical to the instantly claimed invention but are mere obvious variants of the presently claimed invention (hence, necessitating the Terminal Disclaimers)."

Thus, if these commonly-owned patents were found allowable over Sheridan and "Sheridon" and the claims in these patents "are mere obvious variants of the presently claimed invention" then the presently claimed invention must by definition be allowable over Sheridan and "Sheridon." Appellants respectfully submit that this is only further proof of the utter lack of merit in the Examiner's 35 USC 102 rejections.

With regards to the merits of the double patenting rejections themselves, Appellants will submit all necessary Terminal Disclaimers upon reopening of prosecution of the application.

CONCLUSION

For the many reasons advanced above, Appellants respectfully contend that each claim is patentable and reversal of all 35 USC 102 rejections and re-opening of prosecution of the case is respectfully solicited.

I hereby certify that this correspondence is being deposited with the United States Post Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

September 26, 2006
(Date of Transmission)

Alma Smalling
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9/26/06
(Date)

Attachments

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Claims

1. An electronically addressable display comprising:

a substrate;

associated with the substrate, an addressable display bi-modal molecular colorant stratum; and

associated with the molecular colorant stratum, an addressing device mounted for selectively switching colorant molecules of the stratum between at least two visually distinguishable states.

2. The display as set forth in claim 1 comprising:

a first of said two distinguishable states is a transparent state or a colored state.

3. The display as set forth in claim 2 comprising:

a second of said two distinguishable states is another colored state.

4. The display as set forth in claim 1, said bi-modal molecular colorant stratum comprising:

a molecular system, said system including electrochromic, switchable molecules, each of said molecules being selectively switchable between said at least two optically distinguishable states, wherein said system is distributable on the substrate thereby forming a display screen region.

5. The display as set forth in claim 1 comprising:

said colorant molecules exhibit an electric field induced band gap change.

6. The display as set forth in claim 5 comprising:

said electric field induced band gap change occurs via a mechanism selected from a group including (1) molecular conformation change or an isomerization, (2) change of extended conjugation via chemical bonding change to change the band gap, and (3) molecular folding or stretching.

7. The display as set forth in claim 5 comprising:

said electric field induced band gap change occurs via a molecular conformation change or an isomerization.

8. The display as set forth in claim 7 wherein the molecules forming the molecular system further comprise:

at least one stator portion and at least one rotor portion, wherein said rotor rotates from a first state to a second state with an applied electric field, wherein in said first state, there is extended conjugation throughout said molecular system, resulting in a relatively smaller band gap, and wherein in said second state, said extended conjugation is destroyed, resulting in a relatively larger band gap.

9. The display as set forth in claim 7 comprising:

dependent upon direction of electrical field applied, in a first of said states said colorant molecules are in a more conjugated state throughout, having a relatively smaller band gap, and in a second of said states said colorant molecules are in a less conjugated state throughout, having a relatively larger band gap.

10. The display as set forth in claim 5 comprising:

said electric field induced band gap change occurs via a change of extended conjugation via chemical bonding change to change the band gap.

11. The display as set forth in claim 10 comprising:

said electric field induced band gap change occurs via a change of extended conjugation via charge separation or recombination accompanied by increasing or decreasing band delocalization.

12. The display as set forth in claim 11 comprising:

a change from a first state to a second state occurs with an applied electric field, said change involving charge separation in changing from said first state to said second state, resulting in a relatively smaller band gap state, with greater π-delocalization, and recombination of charge in changing from said second state to said first state, resulting in a relatively larger band gap state, with r less π-delocalization.

13. The display as set forth in claim 5 comprising:

said electric field induced band gap change occurs via a change of extended conjugation via charge separation or recombination and π-bond breaking or formation.

14. The display as set forth in claim 13 comprising:

a change from a first state to a second state occurs with an applied electric field, said change involving charge separation in changing from said first state to said second state, wherein in said first state there is no extended conjugation throughout, resulting in a relatively larger band gap state, and wherein in

said second state said extended conjugation is formed and separated positive and negative charges are created, resulting in a relatively smaller band gap state.

15. The display as set forth in claim 5 comprising:

said electric field induced band gap change occurs via a molecular folding or stretching.

16. The display as set forth in claim 15 comprising:

said colorant molecule has three portions, a first portion and a third portion, each bonded to a second, central portion, wherein a change from a first state to a second state occurs with an applied electric field, said change involving a folding or stretching about or of said second portion, wherein in said first state there is extended conjugation, resulting in a relatively smaller band gap state, and wherein in said second state, said extended conjugation is destroyed, resulting in a relatively larger band gap.

17. The display as set forth in claim 1 comprising:

said colorant molecules are arranged to form discrete, addressable picture elements of said display stratum.

18. The display as set forth in claim 17 comprising:

said addressing device is configured for switching selected said picture elements between a transparent state and a colored state.

19. The display as set forth in claim 17 comprising:

said addressing device is configured for switching selected said picture elements between two visually distinctive color states.

20. The display as set forth in claim 1 comprising:

said colorant molecules are bistable, providing a non-volatile component.

21. The display as set forth in claim 1 comprising:

said colorant molecules have a low activation barrier between different said states providing a fast volatile switching therebetween.

22. The display as set forth in claim 1 comprising:

said colorant molecules have more than two said states, switchable such that optical properties of said stratum can be tuned either continuously by application of a decreasing or increasing electric field to form a volatile switch or color of selected display regions are changed abruptly by application of voltage pulses to switch at least one molecular activation barrier.

23. The display as set forth in claim 1 in a computer apparatus.

24. The display as set forth in claim 1 in an electronic appliance.

25. The display as set forth in claim 24 wherein said electronic appliance is an appliance in the group including test and monitoring instruments, musical instruments,

telecommunications devices, personal computing devices, digital photographic devices, or image projection devices.

26. An electronic appliance comprising:

an appliance housing; and

incorporated with the housing, a display device, the display device including at least one writeable imaging stratum forming a pixel array of a bi-modal molecular colorant, and an addressing device mounted for selectively switching colorant molecules of the imaging stratum.

27. The appliance as set forth in claim 26 comprising:

adjacent said imaging stratum, a background stratum in black, white or a predetermined color, wherein said addressing device switches said colorant molecules between a transparent orientation and a color-exhibiting orientation such that said background stratum provides high contrast as viewed through the colorant molecules in the transparent orientation with respect to the colorant molecules in the color-exhibiting orientation.

28. The appliance as set forth in claim 26 comprising:

said imaging stratum further comprising colorant molecules having a first state wherein a picture element formed of said molecules in said first state are displayed in a first color, including black or white, and said colorant molecules having a second state wherein a picture element formed of said molecules in said second state are displayed in a second color, including white or black, presenting a visually high contrast to molecules in said first state.

29. The appliance as set forth in claim 26 wherein said appliance is selected from a group including computers, computing machines of both hard-wired, fixed location and portable types, calculators, electronic books, monitoring instruments, musical instruments or music stands, networked workstations, personal digital assistants, telephones, televisions, test instruments, video games, or wired or wireless communication devices.

30. The appliance as set forth in claim 26 comprising:
said display is a fixed geometry position screen.

31. The appliance as set forth in claim 26 comprising:
said display is a retractable geometry positionable screen.

32. The appliance as set forth in claim 26 comprising:
said colorant molecules are arranged to form discrete, addressable picture elements of said display stratum.

33. The appliance as set forth in claim 26 comprising:
said colorant molecules are bistable, providing a non-volatile component.

34. The appliance as set forth in claim 26 comprising:
said colorant molecules have a low activation barrier between different said states providing a fast volatile switching therebetween.

35. The appliance as set forth in claim 26 comprising:
said colorant molecules have more than two said states, switchable such that optical properties of said stratum can be

tuned either continuously by application of a decreasing or increasing electric field to form a volatile switch or color of selected display regions are changed abruptly by application of voltage pulses to switch at least one molecular activation barrier.

36. A visual display comprising:

at least one writeable imaging stratum forming a pixel array of a bi-modal molecular colorant; and

at least one addressing device mounted for selectively switching colorant molecules of the imaging stratum.

37. The display as set forth in claim 36 comprising:

adjacent said imaging stratum, a background stratum in black, white or a predetermined color, wherein said addressing device switches said colorant molecules between a transparent orientation and a color-exhibiting orientation such that said background stratum provides high contrast as viewed through the imaging stratum regions where the colorant molecules in the transparent orientation with respect to the colorant molecules in the color-exhibiting orientation.

38. The display as set forth in claim 36 comprising:

said imaging stratum further comprising colorant molecules having a first state wherein a picture element formed of said molecules in said first state are displayed in a first color, including black or white, and said colorant molecules having a second state wherein a picture element formed of said molecules in said second state are displayed in a second color, including white or black, presenting a visually high contrast to molecules in said first state.

39. The display as set forth in claim 36 comprising:
said display is a fixed geometry position screen.

40. The display as set forth in claim 36 comprising:
said display is a retractable geometry positionable screen.

41. The display as set forth in claim 36 comprising:
said colorant molecules are arranged to form discrete, addressable picture elements of said display stratum.

42. The display as set forth in claim 36 comprising:
said colorant molecules are bistable, providing a non-volatile component.

43. The display as set forth in claim 36 comprising:
said colorant molecules have a low activation barrier between different said states providing a fast volatile switching therebetween.

44. The display as set forth in claim 36 comprising:
said colorant molecules have more than two said states, switchable such that optical properties of said stratum can be tuned either continuously by application of a decreasing or increasing electric field to form a volatile switch or color of selected display regions are changed abruptly by application of voltage pulses to switch at least one molecular activation barrier.

45. The display as set forth in claim 36 comprising:

a plurality of imaging strata forming a display ensemble wherein each of said imaging strata includes a pixel array of a bi-modal molecular colorant such that colorant molecules thereof are selectively switchable between a transparent state and a primary color state, and

associated with each of said imaging strata, addressing devices mounted for selectively switching colorant molecules of respectively associated imaging stratum of said imaging strata.

46. The display as set forth in claim 36 comprising:

said imaging strata is a mosaic pattern of colorant molecules arranged in addressable picture element groups.

47. The display as set forth in claim 46 wherein said mosaic pattern is formed with ink-jet technology.

48. A method for displaying digital data, the method comprising:

selectively producing localized electric fields at picture elements of a viewing screen; and

using said fields to induce band gap changes in molecules forming said picture elements thereby changing an optical property thereof.

49. The display as set forth in claim 36, said addressing means comprising:

molecular crossbar wiring.

50. A method of fabricating a rewritable display screen, the method comprising:

depositing a substantially homogeneous layer of bi-modal molecular colorant on a surface; and

providing addressable elements adjacent said surface for matrix addressing said surface as addressable picture elements.

51. The method as set forth in claim 50 comprising:

forming the molecular colorant having electric field changeable colorant molecules.

52. The method as set forth in claim 51 comprising:

providing said colorant molecules wherein said molecules are at least bi-modal.

53. The method as set forth in claim 51 comprising:

providing said colorant molecules wherein said molecules are bistable.

54. The method as set forth in claim 50 comprising:

forming each addressable picture element of a set of molecules wherein said colorant molecules exhibit an electric field induced band gap change.

55. The method as set forth in claim 54 comprising:

inducing said band gap change via a mechanism selected from a group including (1) molecular conformation change or an isomerization, (2) change of extended conjugation via chemical bonding change, and (3) molecular folding or stretching.

57. A method of doing business with respect to document publishing and retrieval, the method comprising:

providing a wireless communications site including a server for publishing document content; and

downloading from said site to a wireless telecommunications appliance document content data for read-only display by forming a selectable page-by-page pixel array on a bi-modal molecular colorant display associated with said appliance.

58. A wireless communications appliance, comprising:

a wireless interface;

a display screen having at least one writeable imaging stratum forming a pixel array of a bi-modal molecular colorant; and

at least one addressing device mounted for selectively switching colorant molecules of the imaging stratum.

59. The appliance as set forth in claim 58, said bi-modal molecular colorant comprising:

a molecular system, said system including electrochromic, switchable molecules, each of said molecules being selectively switchable between said at least two optically distinguishable states, wherein said system is distributable on the substrate thereby forming a display screen region.

60. The appliance as set forth in claim 58 comprising:

said colorant molecules exhibit an electric field induced band gap change.

61. The appliance as set forth in claim 60 comprising:

said electric field induced band gap change occurs via a mechanism selected from a group including (1) molecular conformation change or an isomerization, (2) change of extended conjugation via chemical bonding change to change the band gap, and (3) molecular folding or stretching.

62. A projection apparatus comprising:

display means for projecting an image, said display means having a transparent substrate and, associated with said substrate, at least one writeable imaging stratum forming a pixel array of a bi-modal molecular system; and

associated with said imaging stratum, at least one addressing means for selectively switching colorant molecules of the imaging stratum forming an image for projection.

64. An electric field addressable viewing screen comprising:

a substrate;

at least one layer of a bi-modal molecular colorant associated with said substrate such that colorant molecules are addressable as picture elements of the viewing screen, electrically switching the colorant molecules between at least two visually distinct states selectively.

65. The invention as set forth in claim 64 said colorant further comprising:

a bi-modal molecular system for creating alphanumeric characters and graphic images.

66. The invention as set forth in claim 65 wherein each of said molecules exhibit an electric field induced band gap change.

67. The invention as set forth in claim 66 wherein said electric field induced band gap change occurs via a mechanism selected from a group including (1) molecular conformation change or an isomerization, (2) change of extended conjugation

via chemical bonding change to change the band gap, and (3) molecular folding or stretching.

EXHIBIT 1

Color Switch Comparison Chart

	Colorant	Color switch mechanism
Molecular color switch(present invention)	**A molecule or molecules designed to change structural conformation within an electric field.**	**The fundamental color absorption spectra of the molecule changes through an electric field induced conformation change of the molecule. The conformation change alters the HOMO-LUMO states (band gap) of the molecule, via π-electron localization / delocalization.**
Microcapsule color switch(common to E Ink displays)	**A 50-100 nm pigment housed in a colored liquid-filled 30-100 micron diameter microcapsule**	**The colorant moves electrophoretically within the microcapsule and within an electric field so that its position relative to the observer changes. The absorption spectra of the colorant does not change in this process.**
Liquid crystal color switch(common to LCD displays)	**A transparent crystallite dispersed in a liquid medium**	**The orientation of the crystallite changes via an electric field so that it aligns either parallel or perpendicular to a fixed polarizer placed parallel to the plane of the colorant. Light impinging the liquid and polarizer layers is either transmitted or blocked depending on the crystallite orientation. The absorption spectra of the colorant does not change in this process.**

	Colorant	Color switch mechanism
Organic LED color switch(common to OLED displays)	**A molecule or pigment dispersed in a polymeric colorant layer sandwiched between polymeric electron and hole transport layers, respectively.**	**An electron and hole pair are injected into the electron and hole transport layers, respectively, via an electric field. The electron and hole combine at the colorant within the colorant layer. Through combination, the colorant gives off a photon of a characteristic wavelength band. The absorption spectra of the colorant does not change in the process. The colorant is self-emissive (all other above colorants are non-emissive).**

There are no other appeals or interferences related to the present application.